

This Amendment After Final should be entered as it puts the claims in a better condition for appeal. In addition, the subject matter of added claims 44-46 was originally recited in claim 1 (Four Times Amended) and therefore, no additional search is required.

Claims 1, 3-5, 7, 9-12, 23, 27, 38, 39 and 41-43 were rejected under 35 U.S.C. § 102(b) or in the alternative 103(a) as being anticipated or unpatentable over Miyabayashi et al (U.S. Patent No. 5,401,598, hereinafter "Miyabayashi"). The Examiner asserts that Miyabayashi teaches an electrode for a secondary battery including a carbonaceous material which has multiphasic structure comprising a nucleus and a surface layer with a specific surface area measured by the BET method of 1-100 m²/g and a ratio of the nucleus portion to the surface layer portion preferably 20-99% by weight.

By this Amendment, Applicants have amended claims 1, 41-43 to more clearly recite Applicants' invention. The subject matter basis for the amendment to claims 1, 41 and 43 is provided in the examples of the present specification where the toluene insoluble matter of the coat-forming carbon material is 7.8% (Example 24), 8% (Examples 13 and 21) and 30% (Examples 1, 7, 9, 10, 11, 14, 15, 16, 17, 18, 19, 20 and 22). Therefore, incorporating 7.8-30% of toluene insoluble matter into amended claims 1, 41 and 43 is not new matter. Further, with regard to claim 42, washing the coated carbon material with toluene is found throughout the specification, e.g. on page 67, line 6- as filed, and therefore does not constitute new matter.

The present invention, as recited in independent claims 1, 41 and 43, is directed to a coated carbon material with either tar or pitch (primary QI equal to 3% or less).

Pitch naturally has a fusion-causing material which is toluene soluble. Thus, advantageously in a preferred method, and recited in claim 42, the coated carbon material is washed with toluene to prevent fusion of carbon particles after calcination. The advantageous washing step provides for the desired, coated carbon material.

The claimed coated carbon material offers features and advantages not found in the art. For example, since fusion-causing material is removed by the toluene wash, it is not necessary to include a pulverizing step to produce the desired size coated carbon material.

A further discussion of those features and advantages is provided below with reference to the disclosed examples, for exemplary purposes only. The calcined carbon material obtained in Comparative example 5 (without washing step) is fused and aggregated. Comparative example 5 corresponds to the coated carbon material of Miyabayashi. In contrast, the calcined carbon material obtained in Examples 1-24 (with the washing step) is not fused and aggregated. It will be clear from the results of Examples 1-24 and Comparative example 5 that fusion or aggregation of calcined carbon material can be prevented by washing tar- or pitch-coated carbon material. In general, without a washing step, calcination of carbon particles results in fusion of carbon particles which then requires pulverization.

Miyabayashi fails to teach or suggest all claimed elements, namely a core carbon material partially or entirely coated with a coat-forming carbon material whose core material is tar or pitch having 3% or less of primary QI and whose raw material has a toluene insoluble matter of 7.8% to 30%. Further, Miyabayashi fails to teach or suggest a coated carbon material with no grind face.

do what! claim says "not" contains, not "coating"

In direct contrast to the present invention, the coating layer of Miyabayashi contains no toluene insoluble material. The Miyabayashi coating material necessarily will have no toluene insoluble matter. Miyabayashi clearly teaches applying a pitch coating by dipping a carbonaceous material in a pitch toluene solution (see e.g. Miyabayashi Example 3). Since the pitch of Miyabayashi is dissolved in toluene, the pitch coating the carbonaceous material has a toluene insoluble matter of 0%. Therefore, the pitch-coated layer contains only toluene soluble pitch and no toluene insoluble pitch.

NO

Furthermore, Miyabayashi fails to teach or suggest a toluene wash. On the contrary, the Miyabayashi pitch-coated carbonaceous particle cannot be washed with toluene. If the Miyabayashi coated layer were to be washed with a toluene solution, the 100 % toluene soluble pitch-coated layer would be removed from the surface of the carbonaceous particles. In order for a pitch-coated layer to remain on the surface of the core carbon material after a toluene wash, the coating has to contain "toluene insoluble matter". However, as discussed above, the coated layer of Miyabayashi does not contain any toluene insoluble material.

Moreover, with regard to claim 7, Miyabayashi fails to teach a coated carbon material with "no grind face" as claim. On the contrary, Miyabayashi teaches that a grind face is produced from its method. Miyabayashi clearly discloses that its carbon material ⁷requires a pulverization process. As noted above, since the coating layer of Miyabayashi contains fusion-causing material, the coated carbon material of Miyabayashi is subject to clumping together. Thus, Miyabayashi teaches a pulverization step to form the desired size coated carbon material.

20 For example, in Example 4 of Miyabayashi, the pitch applied via a toluene solution, is calcined, and then the calcined particles are lightly pulverized due to the existence of fusion-causing toluene soluble matter in the pitch-coated layer (see Miyabayashi, column 16, lines 66-67). One result of the pulverizing is that the resulting coated carbon material will have a "grind face."

Enclosed herewith, Applicants have provided Photograph I showing carbon particles obtained in Comparative example 5 of the present invention. Photograph I corresponds not only to the pulverization product of fused and aggregate carbon but also to the carbon particles which have flat or uneven surfaces and angular edges which can be obtained by pulverizing product of Miyabayashi. Contrary to Miyabayashi, the coated carbon material of claim 7 does not contain a "grind face."

Based on the foregoing, the claimed invention is not anticipated nor suggested by Miyabayashi. Miyabayashi fails to teach or suggest a coat carbon material in which the coating material contains a toluene insoluble material of 7.8 to 30%, a toluene washing step, and a coated carbon material with no grind face. Therefore, Applicants respectfully request that the Examiner withdraw the rejection to claims 1, 3-5, 7, 9-12, 23, 27, 38, 39 and 41-43 under 35 U.S.C. § 102 (b) or in the alternative § 103(a).

In addition, Applicants respectfully submit that added claims 44-47 are not anticipated or made obvious by Miyabayashi for at least the same reasons as discussed above with regard to the previously rejected claims and further for reciting additional elements not taught or suggested by the prior art of record.

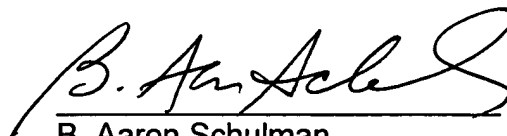
In view of the foregoing, Applicants respectfully submit that the present application is now in condition for immediate allowance.

Respectfully submitted,

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August 2, 2002

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A handwritten signature in black ink, appearing to read "B. Aaron Schulman", written over a horizontal line.

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ATTACHMENT A

Marked Up Replacement Claims

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Following herewith is a marked up copy of each rewritten claim together with all other pending claims.

1. (Five Times Amended) A carbon material wherein edge parts of a core carbon material are partially or entirely coated with a coat-forming carbon material ~~and~~ ¹² (whose raw material is tar or pitch having 3% or less of primary QI) and whose raw material have a toluene insoluble matter of 7.8% to 30%; wherein the carbon material is nearly spherical or ellipsoidal, the carbon material having ~~a specific surface area determined by a BET method of 5 m²/g or less and~~ a covering ratio c defined as a weight ratio of coat-forming carbon material/(core carbon material + coat-forming carbon material) of $0 < c \leq 0.3$, ~~wherein a volume based integrated value of particles having a diameter of 1 μ m or less determined by particle size distribution is 10% or less.~~

3. (Amended) The carbon material according to claim 1 wherein the coat-forming carbon material has a lower crystallinity than the core carbon material.

4. (Twice Amended) The carbon material according to claim 1 wherein the core carbon material is a carbon material with high crystallinity having a mean interplanar spacing (d_{002}) of (002) plane of 0.335-0.340 nm, a thickness of crystallite size in direction of (002) plane (L_c) of at least 10 nm, a thickness of crystallite size in direction of (110) plane (L_a) of at least 10 nm.

5. (Amended) The carbon material according to claim 1 wherein a true specific gravity of entire carbon material is 1.50 to 2.26g/cm³.

7. (Twice Amended) A calcined two-layer carbon material characterized in that edge parts of a core carbon material are partially or entirely coated with a coat-forming carbon material, wherein the carbon material is nearly spheric or ellipsoidal, and has no grinding face, wherein the carbon material has a specific surface area determined by a BET method of 5 m²/g or less and a covering ratio c defined as a weight ratio of coat-forming carbon material/(core carbon material + coat-forming carbon material) of 0<c≤0.3.

9. (Amended) The calcined two-layer carbon material according to claim 7 wherein the coating carbon material has a lower crystallinity than the core carbon material.

10. (Twice Amended) The calcined two-layer carbon material according to claim 7 wherein the core carbon material is carbon material with high crystallinity having a mean interplanar spacing (d002) of (002) plane of 0.335-0.340 nm, a thickness of crystallite size in direction of (002) plane (Lc) of at least 10 nm, a thickness of crystallite size in direction of (110) plane (La) of at least 10 nm.

11. (Amended) The calcined two-layer carbon material according to claim 7 wherein a true specific gravity of entire carbon material is 1.50 to 2.26g/cm³.

12. (Twice Amended) The calcined two-layer carbon material according to claim 7 wherein a volume-based integrated value of particles having a diameter of 1 μm or less determined by particle size distribution is 10% or less.

23. (Twice Amended) A method for producing the coated carbon material of claim 1 comprising calcining the coated carbon material for carbonization.

27. (Thrice Amended) A method for producing the coated carbon material of claim 1, wherein a surface of the coated carbon material is pretreated for oxidation before calcination of the coated carbon material.

38. The carbon material according to claim 1 wherein the carbon material is produced by washing a core carbon material coated with a coat-forming carbon material.

39. The calcined two-layer carbon material according to claim 7 wherein the carbon material is produced by washing a core carbon material coated with a coat-forming carbon material before calcination.

41. A method for producing a coated carbon material comprising calcining for carbonization at a heating rate of up to 10°C/hr a carbon material wherein edge parts of a core carbon material are partially or entirely coated with the coat-forming carbon

material whose raw material is tar or pitch having 3% or less of primary QI and whose raw material have a toluene insoluble matter of 7.8% to 30%, and wherein the carbon material is nearly spherical or ellipsoidal, the carbon material having a specific surface area determined by a BET method of $5\text{m}^2/\text{g}$ or less.

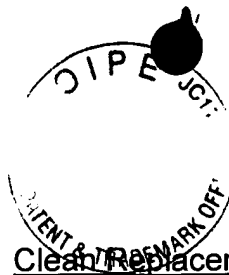
42. A method for producing a coated carbon material comprising washing a carbon core material coated with tar or pitch using a toluene solution and calcining for carbonization in vacuo a carbon material wherein edge parts of a core carbon material are partially or entirely coated with the coat-forming carbon material and wherein the carbon material is nearly spherical or ellipsoidal, the carbon material having a specific surface area determined by a BET method of $5\text{m}^2/\text{g}$ or less.

43. A method for producing a coated carbon material comprising calcining for graphitization a carbon material wherein edge parts of a core carbon material are partially or entirely coated with the coat-forming carbon material whose raw material is tar or pitch having 3% or less of primary QI and whose raw material have a toluene insoluble matter of 7.8% to 30%, and wherein the carbon material is nearly spherical or ellipsoidal, the carbon material having a specific surface area determined by a BET method of $5\text{m}^2/\text{g}$ or less.

44. (New) The carbon material according to claim 1, wherein the carbon material has a specific surface area determined by a BET method of $5\text{m}^2/\text{g}$ or less.

45. (New) The carbon material according to claim 1, wherein a volume-based integrated value of particles having a diameter of 1 μm or less determined by particle size distribution is 10% or less.

46. (New) The carbon material according to claim 1, wherein the carbon material has a covering ratio c of 0.01 to 0.2.



ATTACHMENT B

Clean Replacement/New Claims (Entire Set Of Pending Claims)

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Following herewith is a clean copy of the entire set of pending claims.

1. (Five Times Amended) A carbon material wherein edge parts of a core carbon material are partially or entirely coated with a coat-forming carbon material whose raw material is tar or pitch having 3% or less of primary QI and whose raw material have a toluene insoluble matter of 7.8% to 30%, wherein the carbon material is nearly spherical or ellipsoidal, the carbon material having a covering ratio c defined as a weight ratio of coat-forming carbon material/(core carbon material + coat-forming carbon material) of $0 < c \leq 0.3$.

3. (Amended) The carbon material according to claim 1 wherein the coat-forming carbon material has a lower crystallinity than the core carbon material.

4. (Twice Amended) The carbon material according to claim 1 wherein the core carbon material is a carbon material with high crystallinity having a mean interplanar spacing (d_{002}) of (002) plane of 0.335-0.340 nm, a thickness of crystallite size in direction of (002) plane (L_c) of at least 10 nm, a thickness of crystallite size in direction of (110) plane (L_a) of at least 10 nm.

5. (Amended) The carbon material according to claim 1 wherein a true specific gravity of entire carbon material is 1.50 to 2.26g/cm³.

7. (Twice Amended) A calcined two-layer carbon material characterized in that edge parts of a core carbon material are partially or entirely coated with a coat-forming carbon material, wherein the carbon material is nearly spheric or ellipsoidal, and has no grinding face, wherein the carbon material has a specific surface area determined by a BET method of $5 \text{ m}^2/\text{g}$ or less and a covering ratio c defined as a weight ratio of coat-forming carbon material/(core carbon material + coat-forming carbon material) of $0 < c \leq 0.3$.

9. (Amended) The calcined two-layer carbon material according to claim 7 wherein the coating carbon material has a lower crystallinity than the core carbon material.

10. (Twice Amended) The calcined two-layer carbon material according to claim 7 wherein the core carbon material is carbon material with high crystallinity having a mean interplanar spacing (d_{002}) of (002) plane of 0.335-0.340 nm, a thickness of crystallite size in direction of (002) plane (L_c) of at least 10 nm, a thickness of crystallite size in direction of (110) plane (L_a) of at least 10 nm.

11. (Amended) The calcined two-layer carbon material according to claim 7 wherein a true specific gravity of entire carbon material is 1.50 to 2.26 g/cm^3 .

12. (Twice Amended) The calcined two-layer carbon material according to claim 7 wherein a volume-based integrated value of particles having a diameter of 1 μm or less determined by particle size distribution is 10% or less.

23. (Twice Amended) A method for producing the coated carbon material of claim 1 comprising calcining the coated carbon material for carbonization.

27. (Thrice Amended) A method for producing the coated carbon material of claim 1, wherein a surface of the coated carbon material is pretreated for oxidation before calcination of the coated carbon material.

38. The carbon material according to claim 1 wherein the carbon material is produced by washing a core carbon material coated with a coat-forming carbon material.

39. The calcined two-layer carbon material according to claim 7 wherein the carbon material is produced by washing a core carbon material coated with a coat-forming carbon material before calcination.

41. A method for producing a coated carbon material comprising calcining for carbonization at a heating rate of up to 10°C/hr a carbon material wherein edge parts of a core carbon material are partially or entirely coated with the coat-forming carbon material whose raw material is tar or pitch having 3% or less of primary QI and whose

raw material have a toluene insoluble matter of 7.8% to 30%, and wherein the carbon material is nearly spherical or ellipsoidal.

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42. A method for producing a coated carbon material comprising washing a carbon core material coated with tar or pitch using a toluene solution and calcining for carbonization in vacuo a carbon material wherein edge parts of a core carbon material are partially or entirely coated with the coat-forming carbon material and wherein the carbon material is nearly spherical or ellipsoidal.

43. A method for producing a coated carbon material comprising calcining for graphitization a carbon material wherein edge parts of a core carbon material are partially or entirely coated with the coat-forming carbon material whose raw material is tar or pitch having 3% or less of primary QI and whose raw material have a toluene insoluble matter of 7.8% to 30%, and wherein the carbon material is nearly spherical or ellipsoidal.

44. (New) The carbon material according to claim 1, wherein the carbon material has a specific surface area determined by a BET method of 5 m²/g or less.

45. (New) The carbon material according to claim 1, wherein a volume-based integrated value of particles having a diameter of 1 μm or less determined by particle size distribution is 10% or less.

46. (New) The carbon material according to claim 1, wherein the carbon material has a covering ratio c of 0.01 to 0.2.